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10/045,438

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Jonathan W. Lai

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12/30/2003

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EXAMINER

ELLINGTON, ALANDRA

ART UNIT

PAPER NUMBER

2855

DATE MAILED: 12/30/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/045,438

Applicant(s)

LAI ET AL.

Examiner

Alandra N Ellington

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-35 is/are pending in the application.
- 4a) Of the above claim(s) 10-14 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1,2,8,9,15-18,22,32,33 and 35 is/are rejected.
- 7) ☒ Claim(s) 3-7,19-21,23-31 and 34 is/are objected to.
- 8) ☒ Claim(s) 1-35 are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07 November 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). ____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3. 6) ☐ Other: ____

Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-9 and 15-35, drawn to a method to compensate for stress-induced deflection in a compound microprobe, classified in class 73, subclass 800.
- II. Claims 10-14, drawn to a microprobe assembly, classified in class 73, subclass 105.

The inventions are distinct, each from the other because:

Inventions I and II are related as process and apparatus for its practice. The inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced by another materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different process. (MPEP § 806.05(e)). In this case the process as claimed can be practiced by another materially different apparatus, such as an optical beam bounce deflection detection system.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

During a telephone conversation with Jay Durst on 10/15/03 a provisional election was made without traverse to prosecute the invention of I, claims 1-9 and 15-35. Affirmation of this election must be made by applicant in replying to this Office action. Claims 10-14 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

DETAILED ACTION

Drawings

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description: reference characters 81, 82 and 84 (Fig. 4B). A proposed drawing correction, corrected drawings, or amendment to the specification to add the reference sign(s) in the description, are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: "deflection detection system 124" (pg. 12 line 12). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

The disclosure is objected to because of the following informalities:

On pg. 2 line 2, remove the enlarged space between "diffraction" and "grating".

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On pg.12 line 2, delete "the" before "measured amount".

Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-2, 8-9, 32-33 and 35 are rejected under 35 U.S.C. 102(b) as being anticipated by Watanabe et al (5,723,775).

With respect to Claim 1, Watanabe et al discloses a method to compensate for stress-induced deflection in a compound microprobe, the microprobe including a substrate, a microcantilever 504 extending outwardly from the substrate 534, and a film 537 formed on the microcantilever 504, said method comprising the steps of: determining an amount of stress-induced deflection of the microcantilever 104,504; and mounting the microprobe so as to compensate for the stress-induced deflection (col. 4 lines 48-67, col. 5 lines 1-16,47-67, col. 6 lines 1-5, col. 8 lines 21-64).

With respect to Claim 2, Watanabe et al discloses the method of claim 1, wherein said mounting step includes selecting a compensation piece 109, based upon the amount of stress-induced deflection (col. 5 lines 46-64, col. 6 lines 7-26 {Figs. 1 and 2}).

With respect to Claim 8, Watanabe et al discloses the method of claim 2, wherein said mounting step includes coupling a bottom surface of the substrate 104 to the compensation piece 109 (col. 4 lines 58-64 {Figs. 1 and 2}).

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With respect to Claim 9, Watanabe et al discloses the method of claim 2, wherein the stress-induced deflection is a static deflection caused by the film 537 (col. 9 lines 6-20).

With respect to Claim 32, Watanabe et al discloses a compound microprobe assembly comprising: a microprobe mount 106; a microprobe 104,104a coupled to said microprobe mount 106, the microprobe 104,104a having an amount of static stress-induced deflection; and wherein said microprobe mount 106 is configured so as to compensate for the amount of static deflection (col. 4 lines 48-52,54-64, col. 5 lines 46-64, col. 6 lines 7-26 {Fig. 1}).

With respect to Claim 33, Watanabe et al discloses the microprobe assembly of claim 32, wherein said microprobe mount 106 includes a support 106 and a compensation piece 109 having a shape corresponding to the amount of static deflection (col. 5 lines 46-64, col. 6 lines 7-26 {Figs. 1 and 2}).

With respect to Claim 35, Watanabe et al discloses the microprobe assembly of claim 33, wherein said support 106 and said compensation piece 109 are integrally formed (col. 4 lines 58-64 {Figs. 1,2 and 6}).

Claims 15-18 and 22 are rejected under 35 U.S.C. 102(b) as being anticipated by Quate (5,517,280).

With respect to Claim 15, Quate discloses a method of compensating an amount of static deflection associated with at least one microprobe of a first planar array of

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microprobes, each microprobe of the array including a substrate, a microcantilever extending outwardly from the substrate, and a film formed on the microcantilever, the method comprising the steps of: directing a beam of light towards a first microprobe of the first array of microprobes; reflecting the beam off the microcantilever 77 off the first microprobe; determining a first amount of static deflection based on the reflected beam; and selecting a first microprobe compensation piece 26,99 based upon the first amount of deflection (abstract, col. 4 lines 42-46, col. 5 lines 5-55, col. 6 lines 39-67, col. 7 lines 1-9 {Fig. 7A}).

With respect to Claim 16, Quate discloses the method of claim 15, further comprising the step of mounting the first microprobe on the first selected microprobe compensation piece 26,99 (col. 6 lines 46-67, col. 7 lines 1-9).

With respect to Claim 17, Quate discloses the method of claim 15, further comprising the step of: mounting each of the microprobes of the first planar array of microprobes on a compensation piece having the same shape as the first selected microprobe compensation piece 99 (col. 6 lines 39-67, col. 7 lines 1-64 {Fig. 9}).

With respect to Claim 18, Quate discloses the method of claim 15, further comprising the step of: repeating said directing, reflecting, determining and selecting steps for each of the microprobes of the first array of microprobes; and then mounting each of the microprobes on a corresponding compensation piece 99 having a shape selected according to a corresponding amount of static deflection (col. 6 lines 46-67, col. 7 lines 1-64 {Fig. 9}).

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With respect to Claim 22, Quate discloses the method of claim 16, further comprising the step of: integrally forming the first array of microprobes from a single wafer 24 prior to the directing step (col. 4 lines 4-8 {Fig. 6A}).

Allowable Subject Matter

Claims 3-7, 19-21, 23-31 and 34 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- A. Diaz et al (5,386,442) discloses a method and apparatus for controlling the load.
- B. Etienne et al (5,189,918) discloses a null flow sensor.
- C. Adderton et al (6,189,374 B1) discloses an active probe for an AFM.
- D. Shimizu et al (6,664,540 B2) discloses a microprobe.
- E. Marcus et al (5,475,318) discloses a microprobe.
- F. Babcock et al (5,898,106) discloses a method and apparatus for obtaining improved vertical metrology measurements.

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G. Volcker (5,986,262) discloses a probe array for a scanning probe microscope.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alandra N Ellington whose telephone number is (703)305-4449. The examiner can normally be reached on Monday - Friday, 6:30am - 4:00pm.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Lefkowitz can be reached on (703)305-4816. The fax phone number for the organization where this application or proceeding is assigned is (703)308-7382.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

Alandra Ellington
Art Unit 2855



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